Complex Numbers

PAGE No.
DATE / /

Sums :

Q.1) Which of the following complex number is equal to

$(5 + 12i) - (9i^2 - 6i)$

For $i = \sqrt{-1}$?

A] $-14 - 18i$
B] $-4 - 6i$
C] $4 + 6i$
D] $14 + 18i$

Sol^n $(5+12i) - (9i^2 - 6i)$

$= 5 + 12i - (-9 - 6i)$ $\{\because i^2 = -1\}$

$= 5 + 12i + 9 + 6i$

$= 5 + 9 + 12i + 6i$

$= 14 + 18i$

Ans :- [D]

PAGE No.
DATE / /

Q.2. Which of the following complex number is equivalent to

$\frac{3-5j}{8+2j}$? (Note $j = \sqrt{-1}$)

A] $\frac{3}{8} - \frac{5j}{2}$

B] $\frac{3}{8} + \frac{5j}{2}$

C] $\frac{7}{34} - \frac{23j}{34}$

D] $\frac{7}{34} + \frac{23j}{34}$

Sol^n

$$\frac{3-5j}{8+2i}$$

[(Conjugate by multiplying & dividing by $(8-2i)$)]

$$\frac{3-5i}{8+2i} \times \frac{(8-2i)}{(8-2i)}$$

$$= \frac{(3-5i)\ (8-2i)}{(8+2i)\ (8-2i)}$$

$$= \frac{(3-5i)(8-2i)}{8^2 + 2^2}$$

$$\{ \because (a+ib)(a-ib) = a^2 + b^2 \}$$

$$= \frac{(3-5i)(8-2i)}{64+4}$$

$$= \frac{(3-5i)(8-2i)}{68}$$

$$= \frac{3(8-2i) - 5i(8-2i)}{68}$$

$$= \frac{24 - 6i - 40i + 10i^2}{68}$$

$$= \frac{24 + 10i^2 - 46i}{68}$$

$$= \frac{24 - 10 - 46i}{68} \qquad \{ \because i^2 = -1 \}$$

$$= \frac{14 - 46i}{68}$$

$$= \frac{\cancel{14}^{7}}{\cancel{68}_{34}} - \frac{\cancel{46}^{23} i}{\cancel{68}_{34}}$$

$$= \frac{7}{34} - \frac{23}{34} i$$

$\therefore$ ANS :- [C]